George Massey Tunnel Replacement Project

Technical Briefing

December 16, 2015

George Massey Tunnel Replacement Project

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BRITISH COLUMBIA

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Overview

New 3.3 km bridge
(8 lanes plus 2 transit/HOV lanes)

Replace 3 key interchanges

24 km of Highway 99 improvements

50 km of dedicated transit/HOV lanes
(transit priority to Canada Line at Bridgeport)

Bike and pedestrian pathway

Allow for future rapid transit

Decommission Tunnel

Cost:
$3.5 billion

Benefit/Cost Ratio:
2.1 to 1

Funding:
Funded through user tolls

30-year public private partnership

Procurement to begin in 2016

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Project Chronology

1991-1995	2001/2004	2012
Alternative Corridor Studies	Tunnel Seismic Reviews	**November:** Phase 1 Consultation *(understanding the need)*

2013	2014-2015
March: Phase 2 Consultation *(exploring the options);* technical work **September:** New bridge within the existing corridor announced, subject to a Project Definition Report and Business Case	Technical work; cost estimate; business case analysis Consultation with municipalities, stakeholders and First Nations

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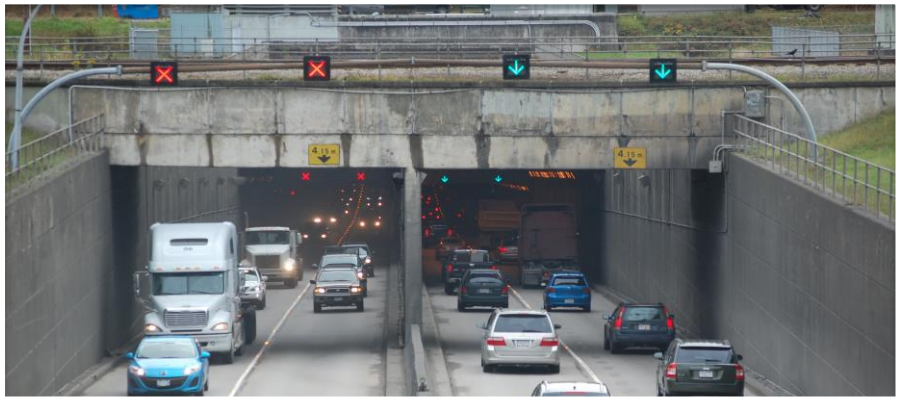
Existing Challenges



- Collisions
- Congestion
- Unreliability
- Seismic vulnerability
- Tunnel dimensions sub-standard
- No capacity for cycling or walking

- Impacts on:
  - People
  - Goods
  - Jobs
  - Tourism
  - Transit users

Condition of Existing Tunnel


Delta Museum & Archives Society Photograph # 1984-95-31

Opened in 1959

Designed to highway standards of the 1950s

Electrical/mechanical system is 50+ years

30+ year old counterflow system

Partial seismic upgrade completed spring 2006

Vulnerable to seismic event; 1950s approach

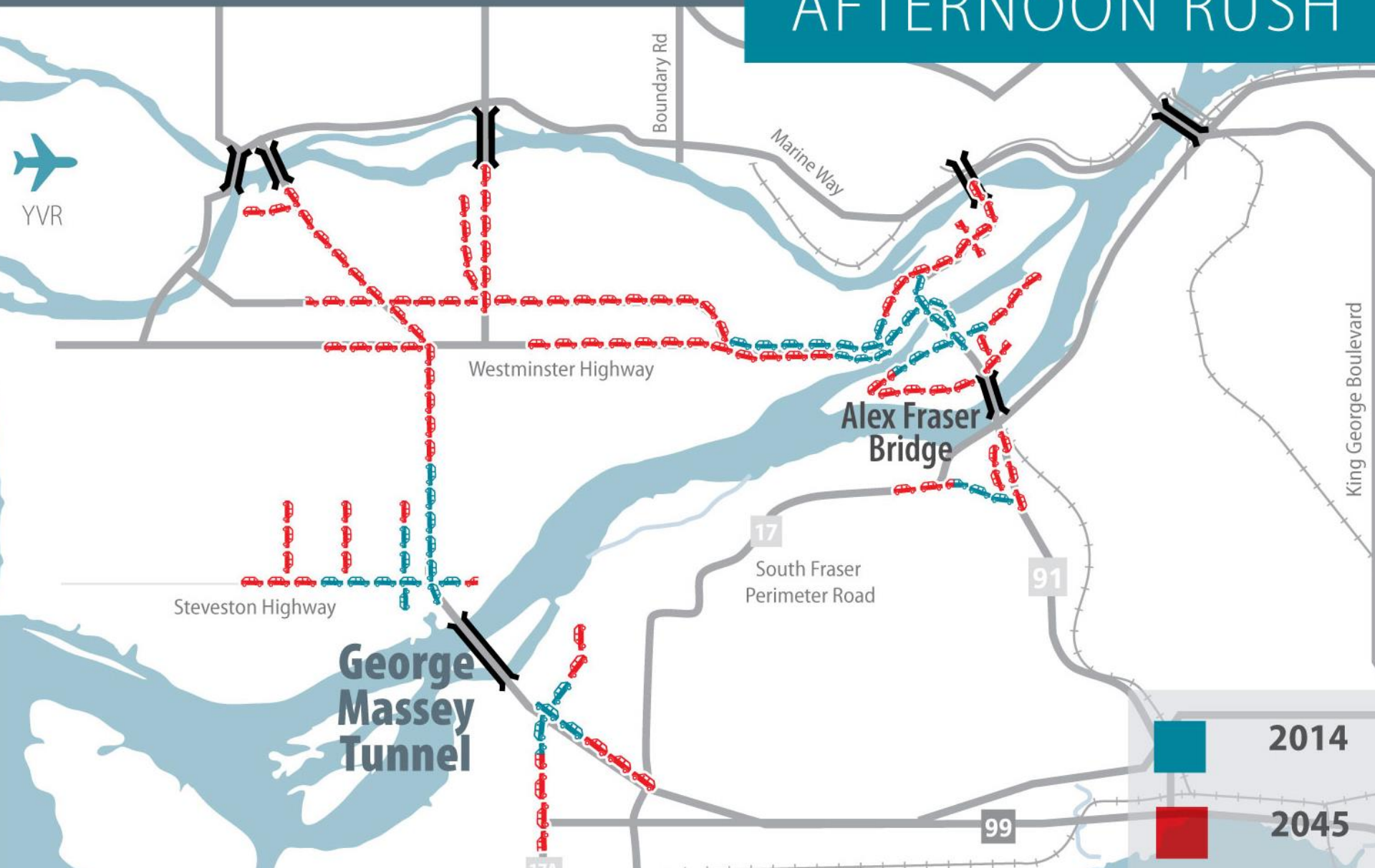
Additional seismic upgrades are high risk

EXPECTED QUEUE LENGTHS WITH FOUR-LANE TUNNEL
(NO NEW BRIDGE)

MORNING RUSH

EXPECTED QUEUE LENGTHS WITH FOUR-LANE TUNNEL
(NO NEW BRIDGE)

AFTERNOON RUSH



Project Goals

Reduce congestion

Improve safety

Support trade and commerce

Support improved transit on Hwy 99

Support options for pedestrians and cyclists

Enhance the Environment

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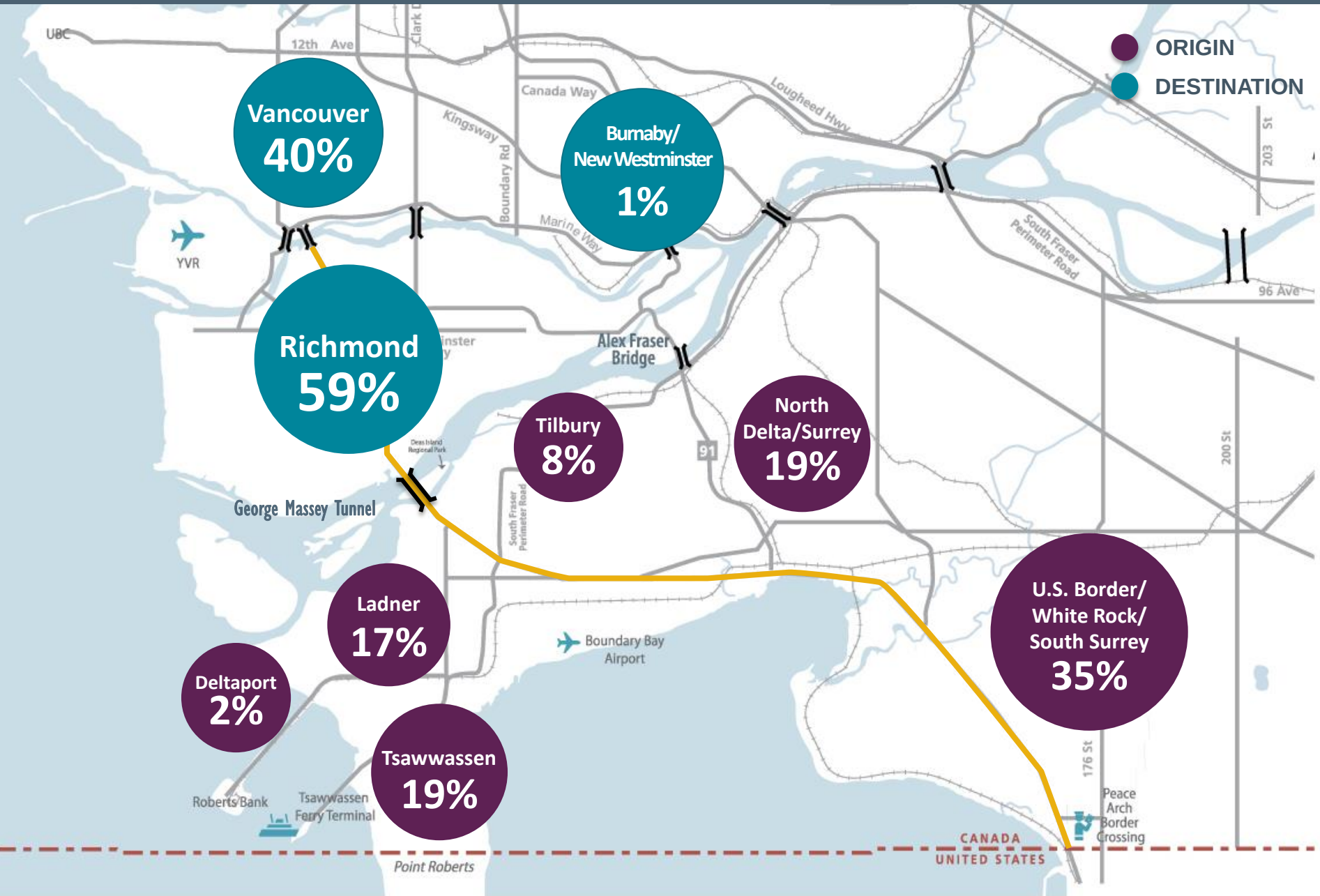
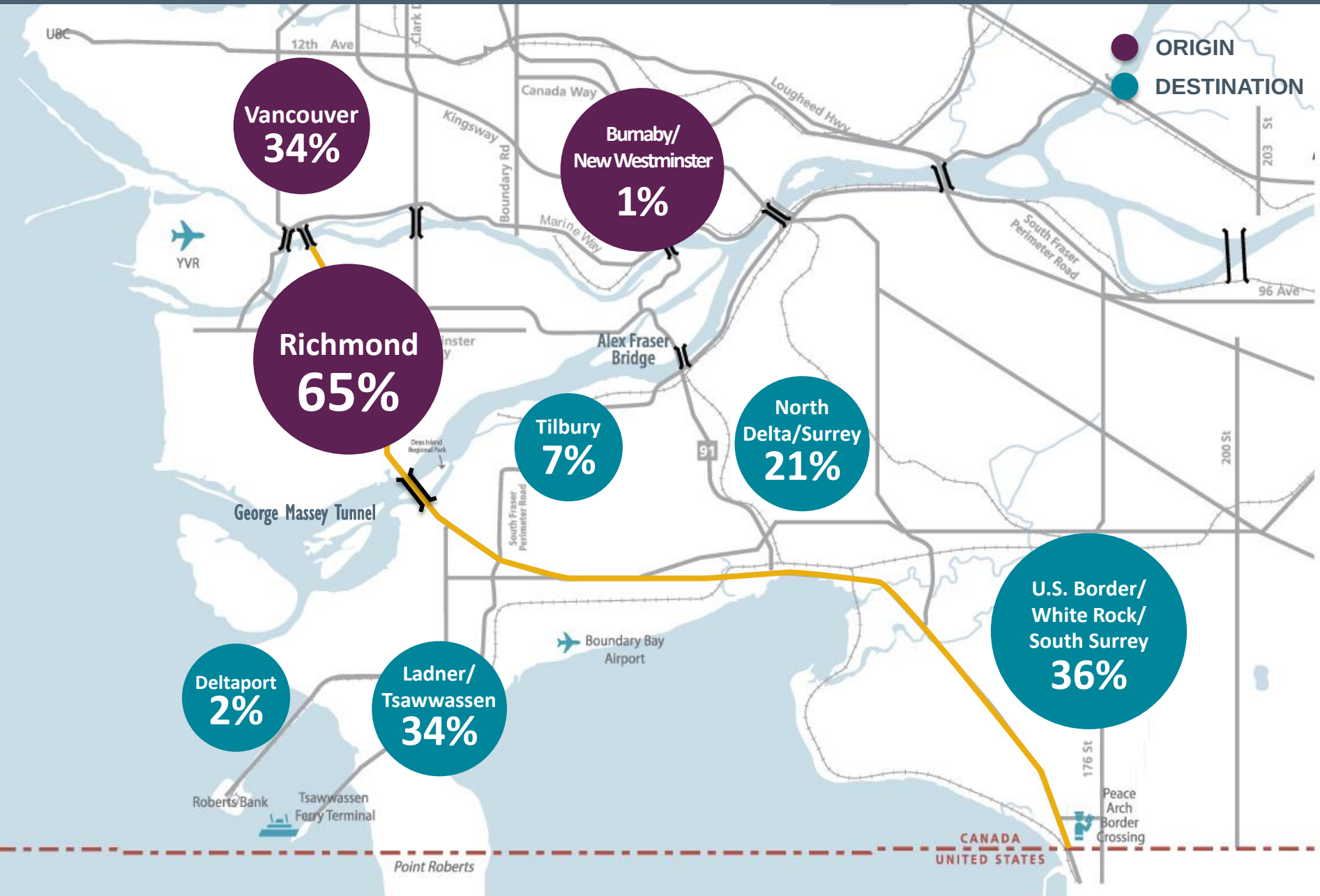
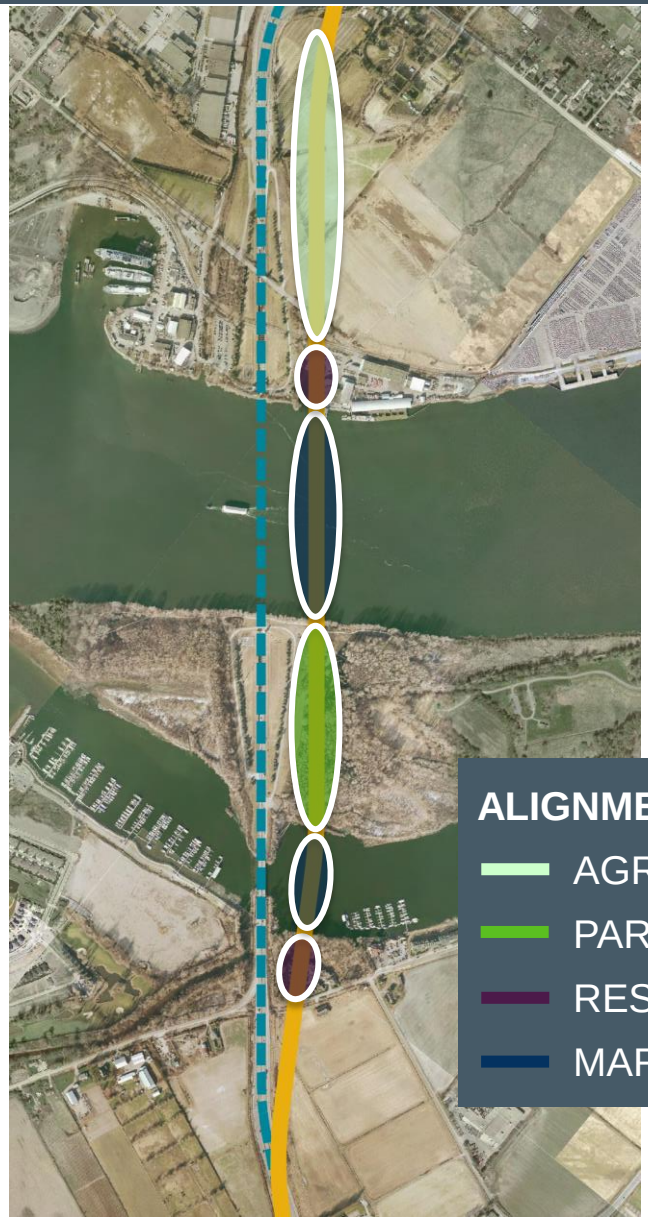
Traffic Analysis: Northbound Traffic

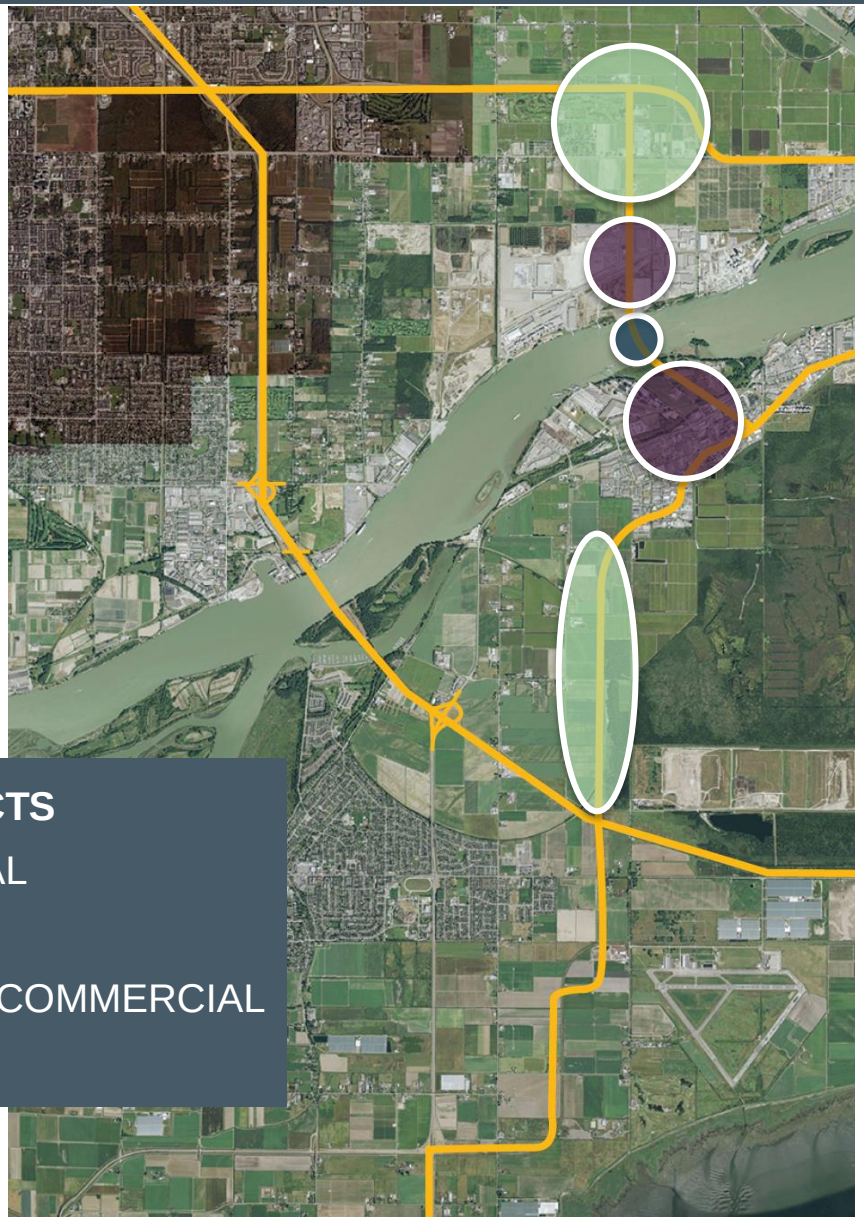


Traffic Analysis: Southbound Traffic



Options Analysis: Phase 2 Consultation

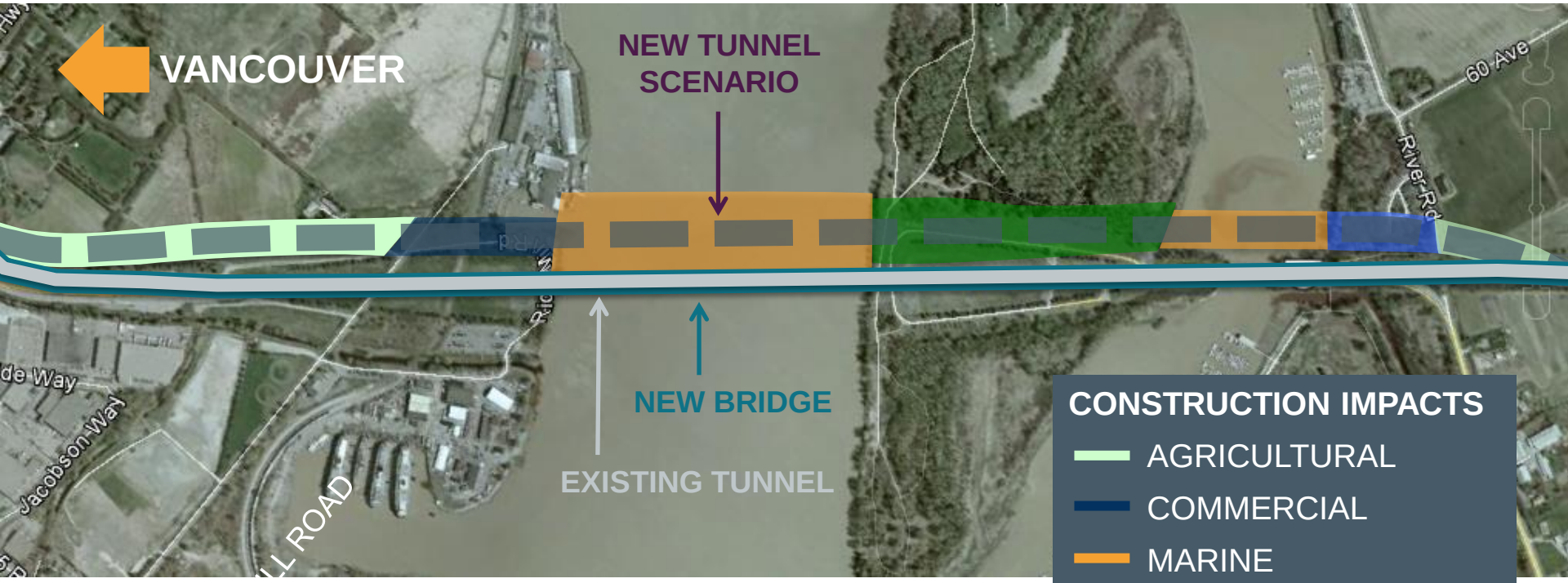




ALIGNMENT EFFECTS

- AGRICULTURAL
- PARKLAND
- RESIDENTIAL/COMMERCIAL
- MARINE

Tunnel Scenario Effects



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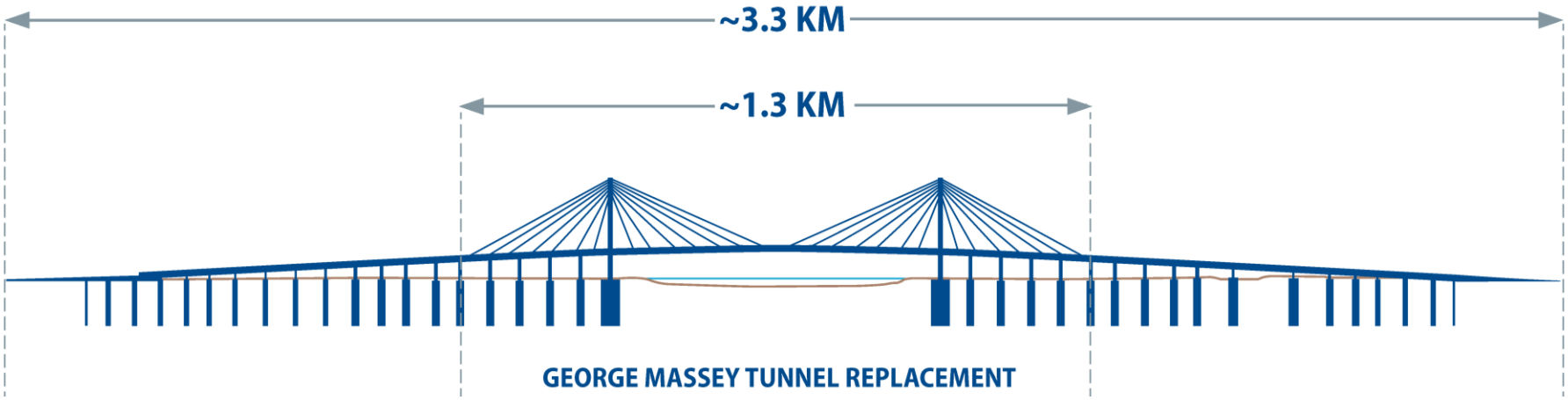
Project Scope

Bridge Concept



- 3.3 km long
- 660 m clear span over the Fraser River
- 200 m high towers
- 2-way navigation channel with 57 m clearance

- 100 year service life
- Optimize lifecycle performance
- Design for future rapid transit

- 34,000 concrete trucks
- 50,000 t rebar
- 30,000 t steel
- 66 km of pile length
- 18,000 t asphalt

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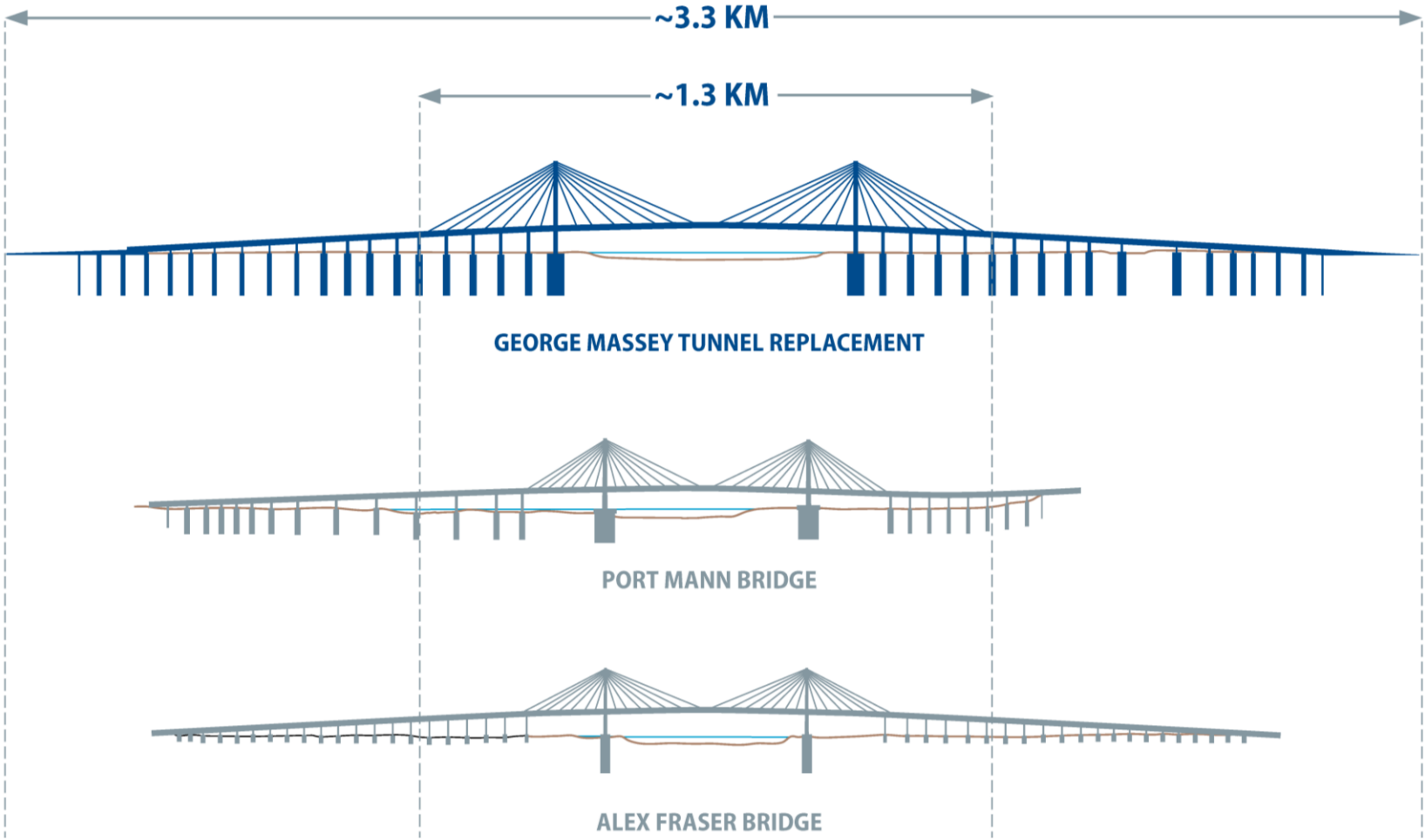
Major Bridges in the Lower Mainland



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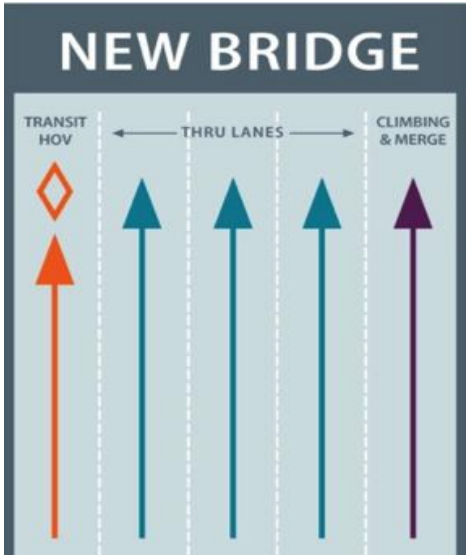
Why Five Lanes in Each Direction?

1 Dedicated transit/HOV lanes

3 Regular traffic lanes

(same as today in rush hour)

1 Lane for slow, merging traffic

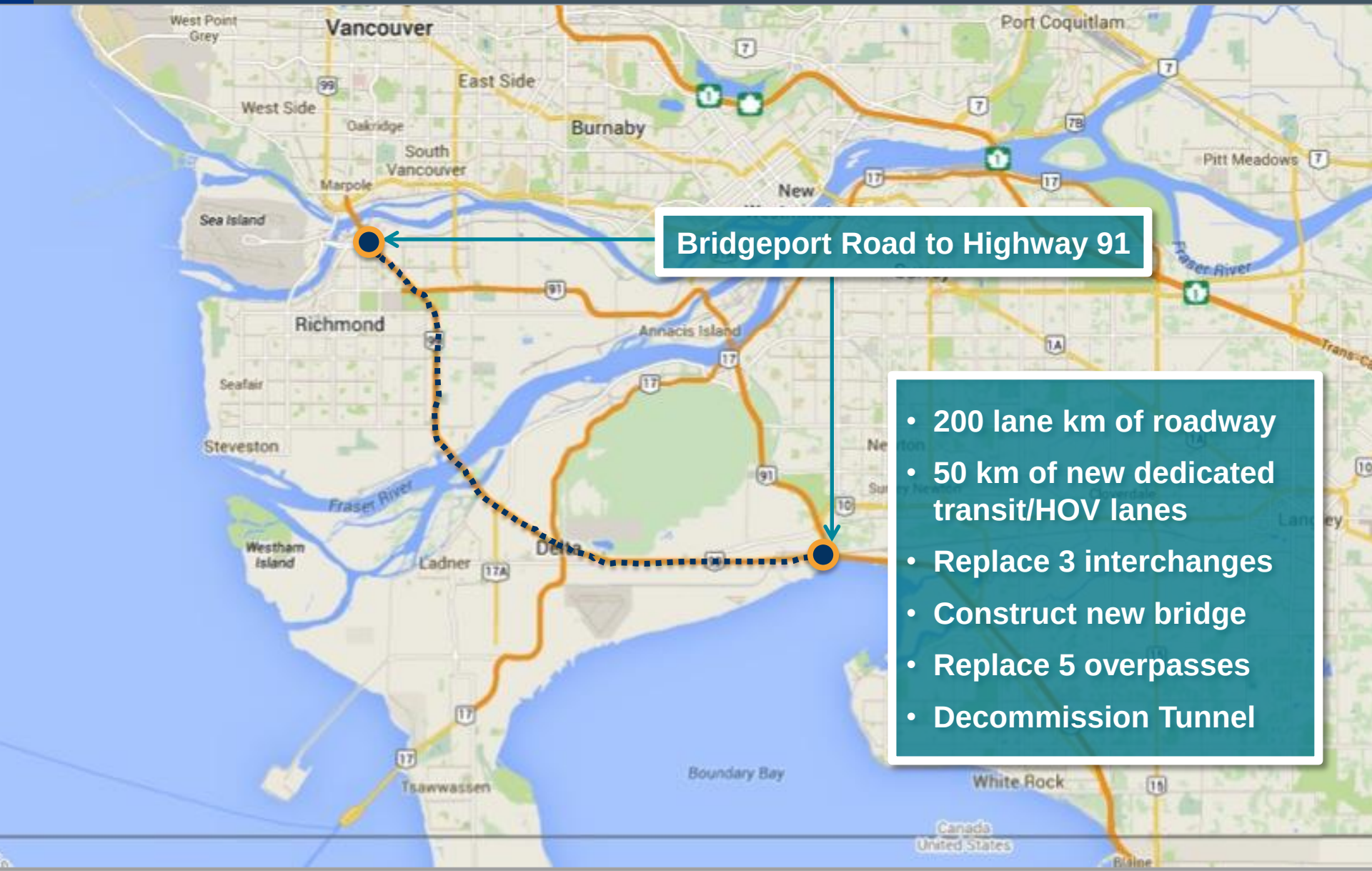


Benefits:

- Improved merging safety
- Reduced weaving
- Reduced congestion/increased reliability
- Improved emergency response access

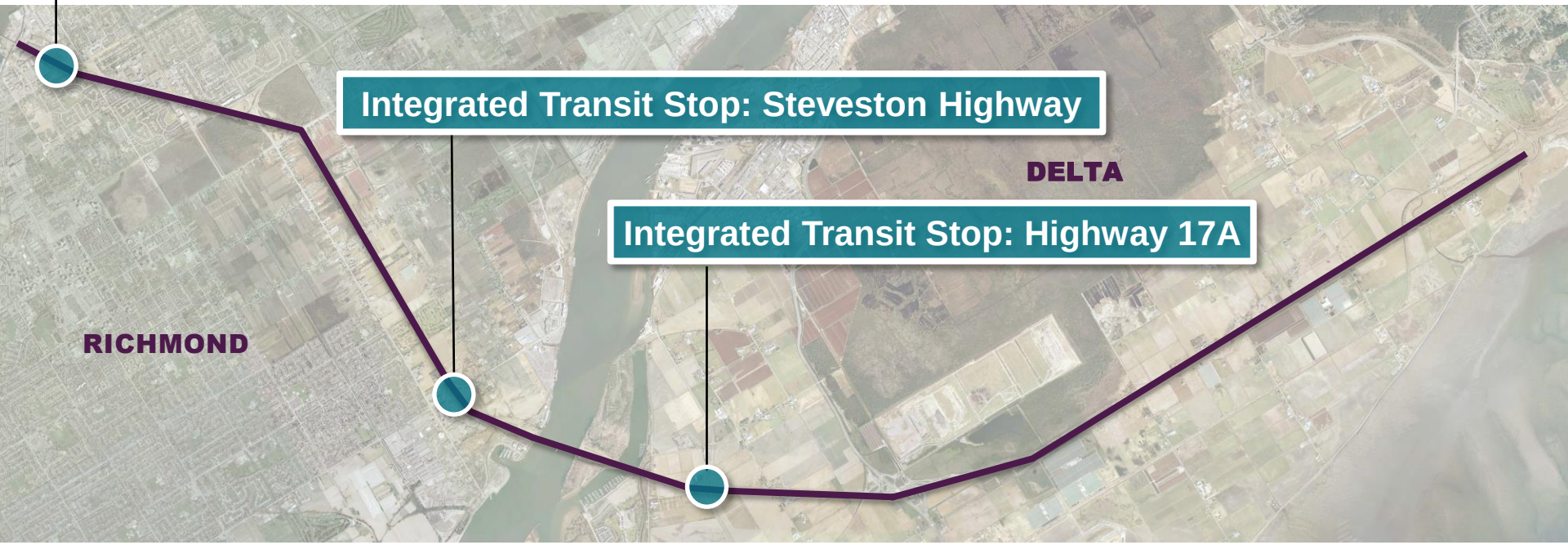
Four lanes in each direction would result in congestion on opening day

Project Scope



Project Scope – Transit

Dedicated Transit connection between Highway 99 and Bridgeport Canada Line Station



50 LANE KILOMETRES OF DEDICATED/MEDIAN TRANSIT LANES

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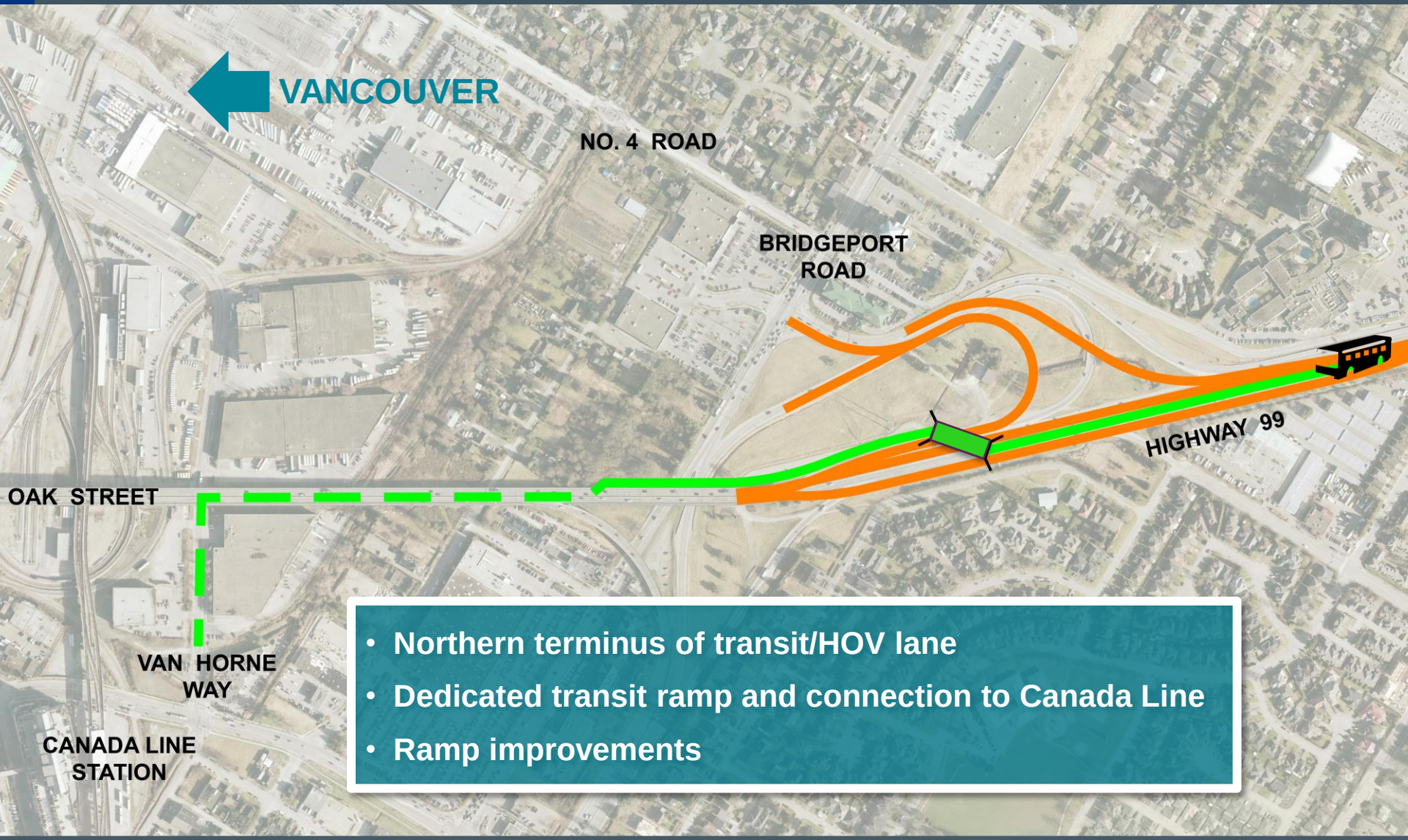
Project Scope – Transit

- 50 km of new dedicated transit lanes
- Transit stops integrated with the Steveston Highway and Highway 17A interchanges
- Dedicated transit ramp from Highway 99 to Bridgeport Road
- Safe and reliable transit access to Canada Line at Bridgeport Station
- Allowance for future rapid transit on the new bridge

- **Highway 99 is already a major transit route**
- **One bus through the tunnel every 3-4 minutes**
- **More than 10,000 transit riders daily through the tunnel**
- **Highest transit use of any Fraser River road crossing**

Bridgeport Road

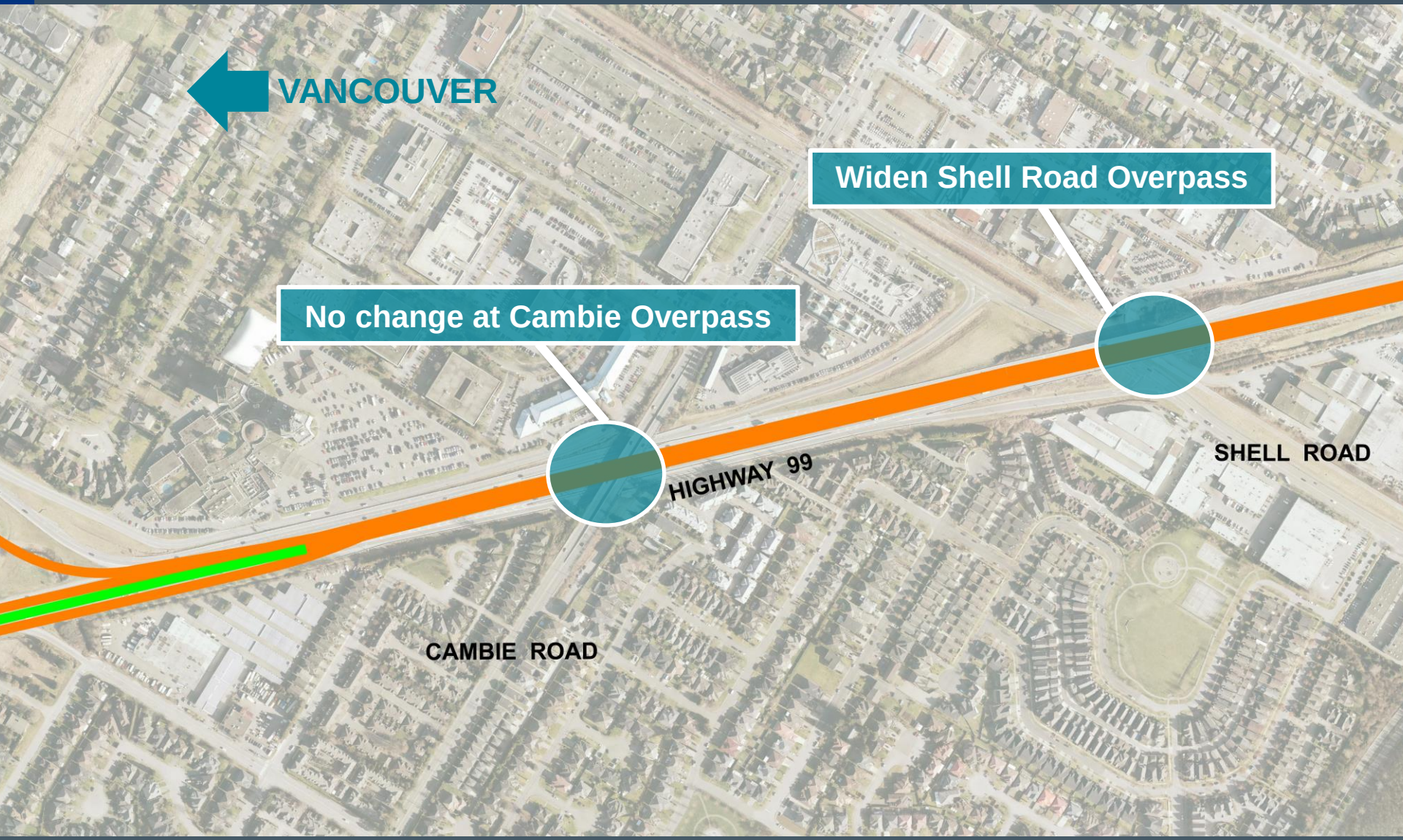


- Northern terminus of transit/HOV lane
- Dedicated transit ramp and connection to Canada Line
- Ramp improvements

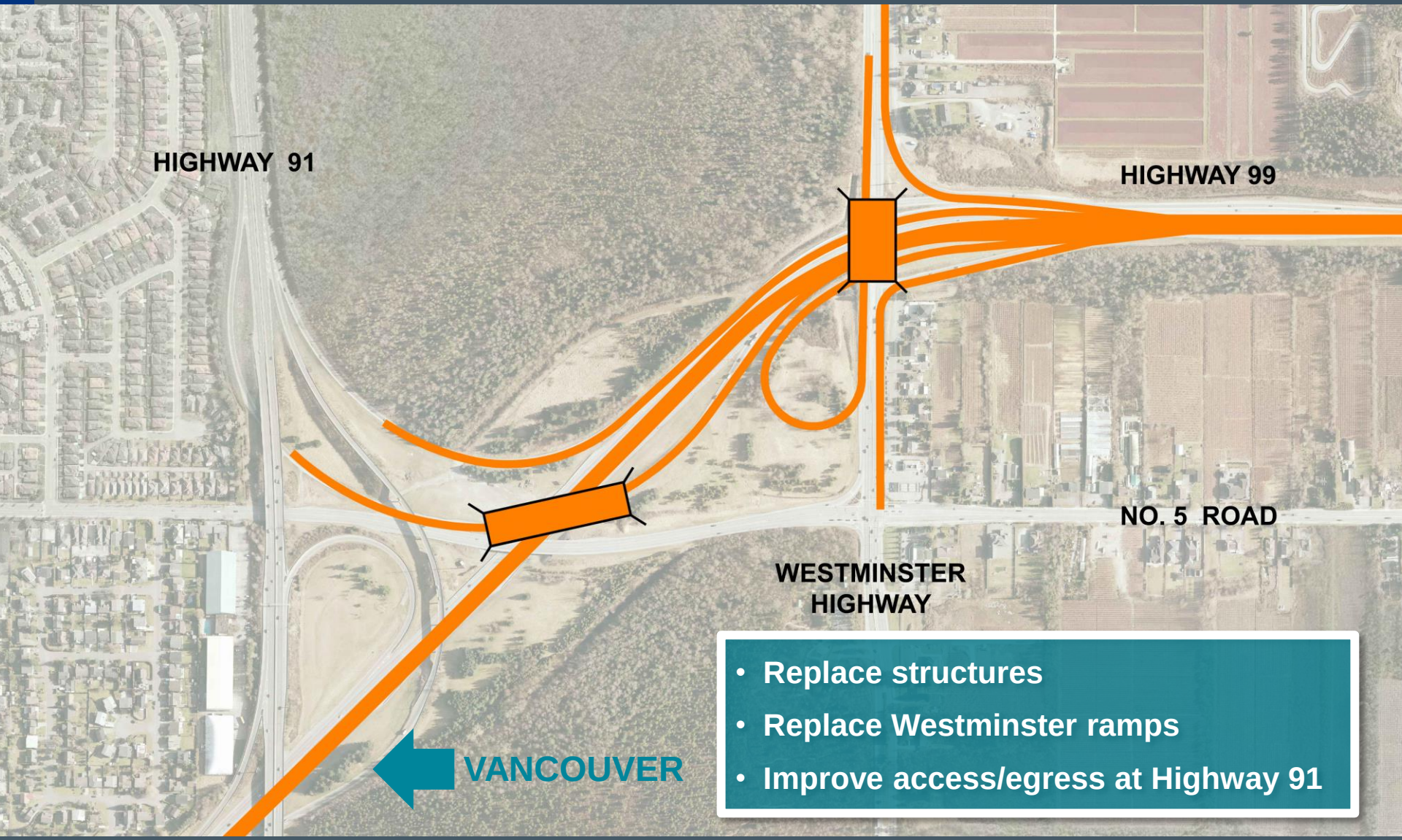
What Happens at the Oak Street Bridge?

- Morning queues will continue as they do today; traffic patterns may change somewhat but no significant change in total traffic
  - 60% of tunnel users end their trip in Richmond
  - Efficiency of Oak Street Bridge will continue to be governed by traffic lights at 70th Street
  - Traffic volumes on the Oak Street Bridge have been relatively constant or declining over the past decade (Canada Line effect)

Bridgeport Road to Highway 91

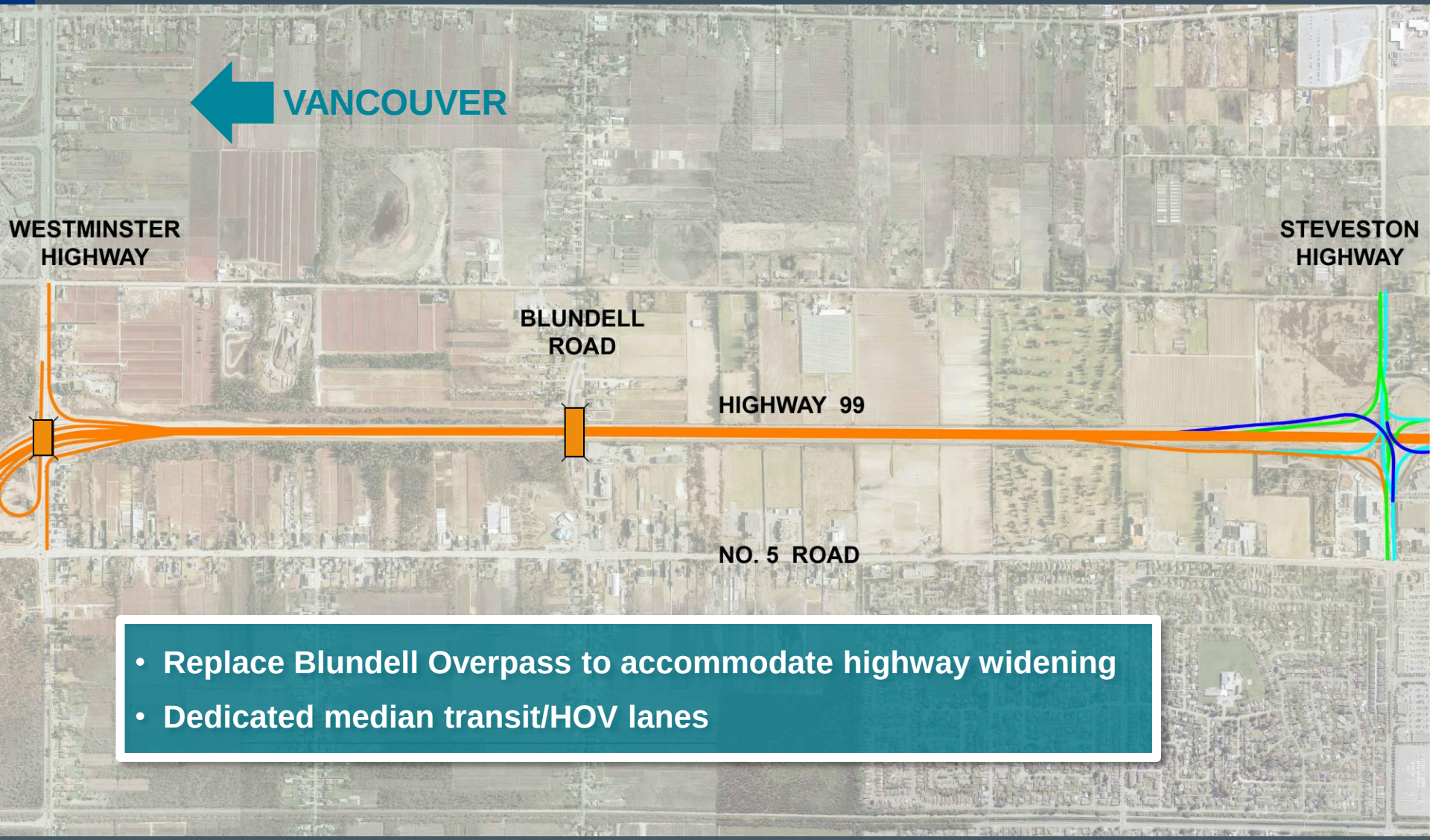


Highway 91/Westminster Highway



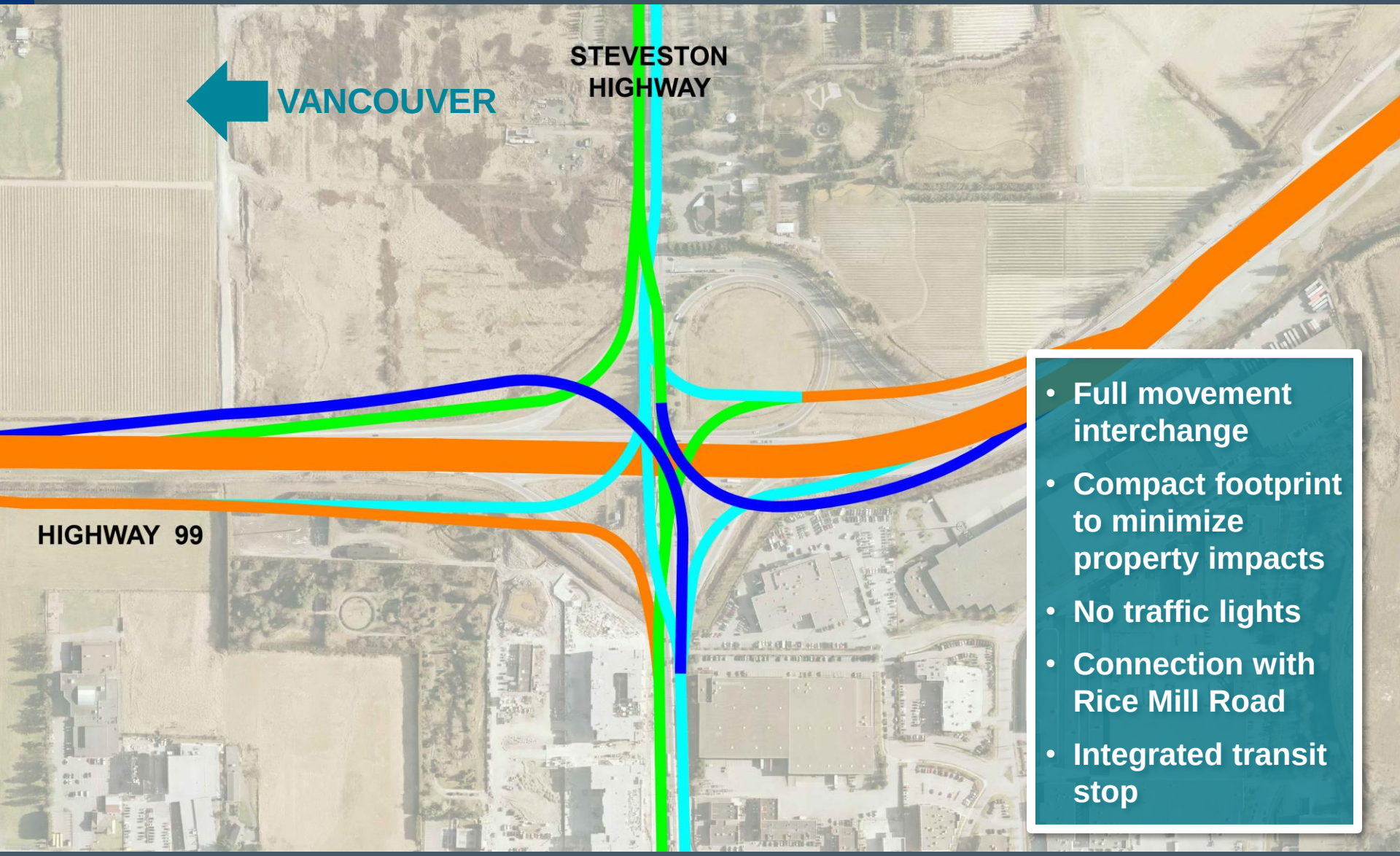
- Replace structures
- Replace Westminster ramps
- Improve access/egress at Highway 91

Westminster Highway to Steveston



- Replace Blundell Overpass to accommodate highway widening
- Dedicated median transit/HOV lanes

Steveston Highway

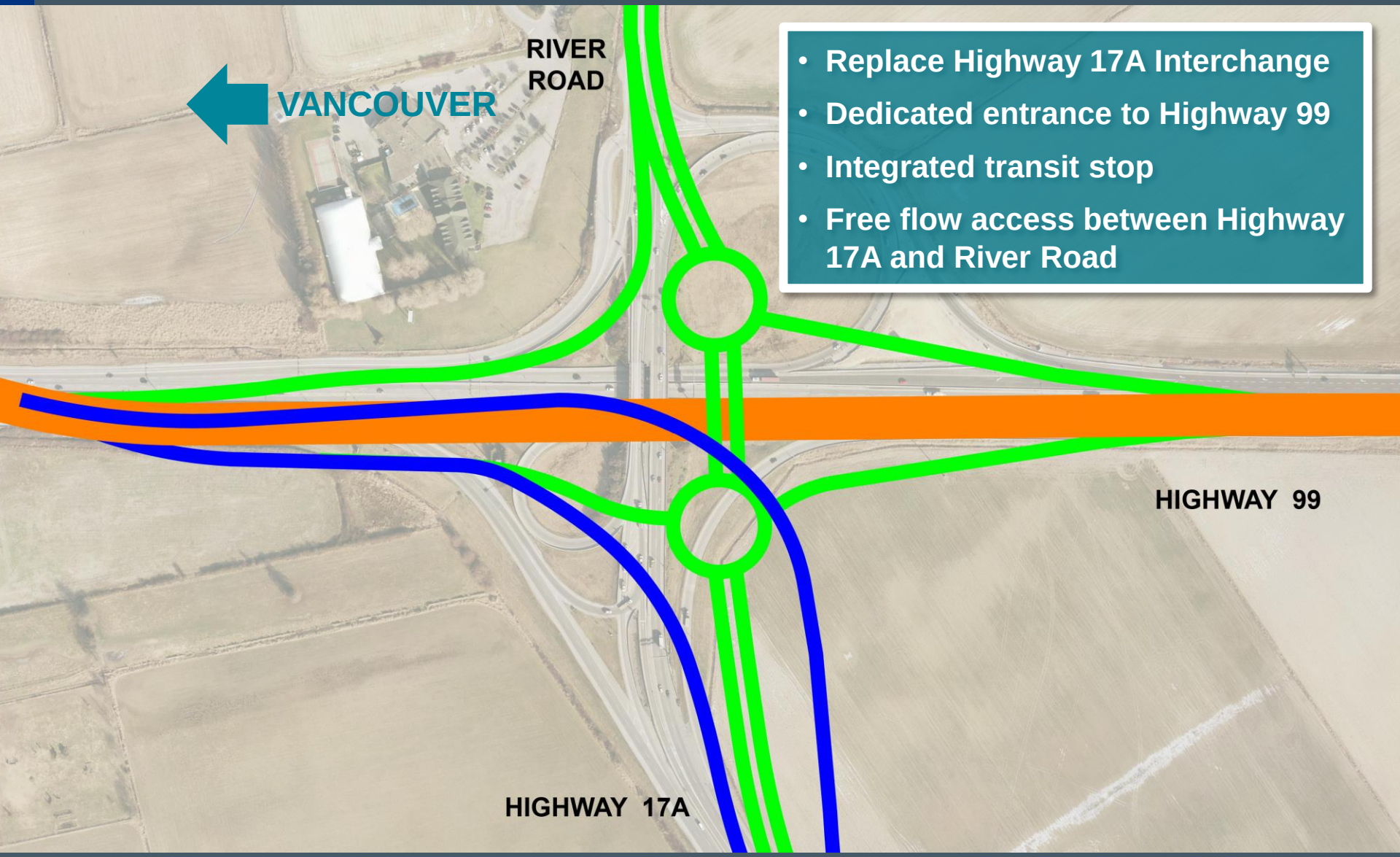


- Full movement interchange
- Compact footprint to minimize property impacts
- No traffic lights
- Connection with Rice Mill Road
- Integrated transit stop

Bridge

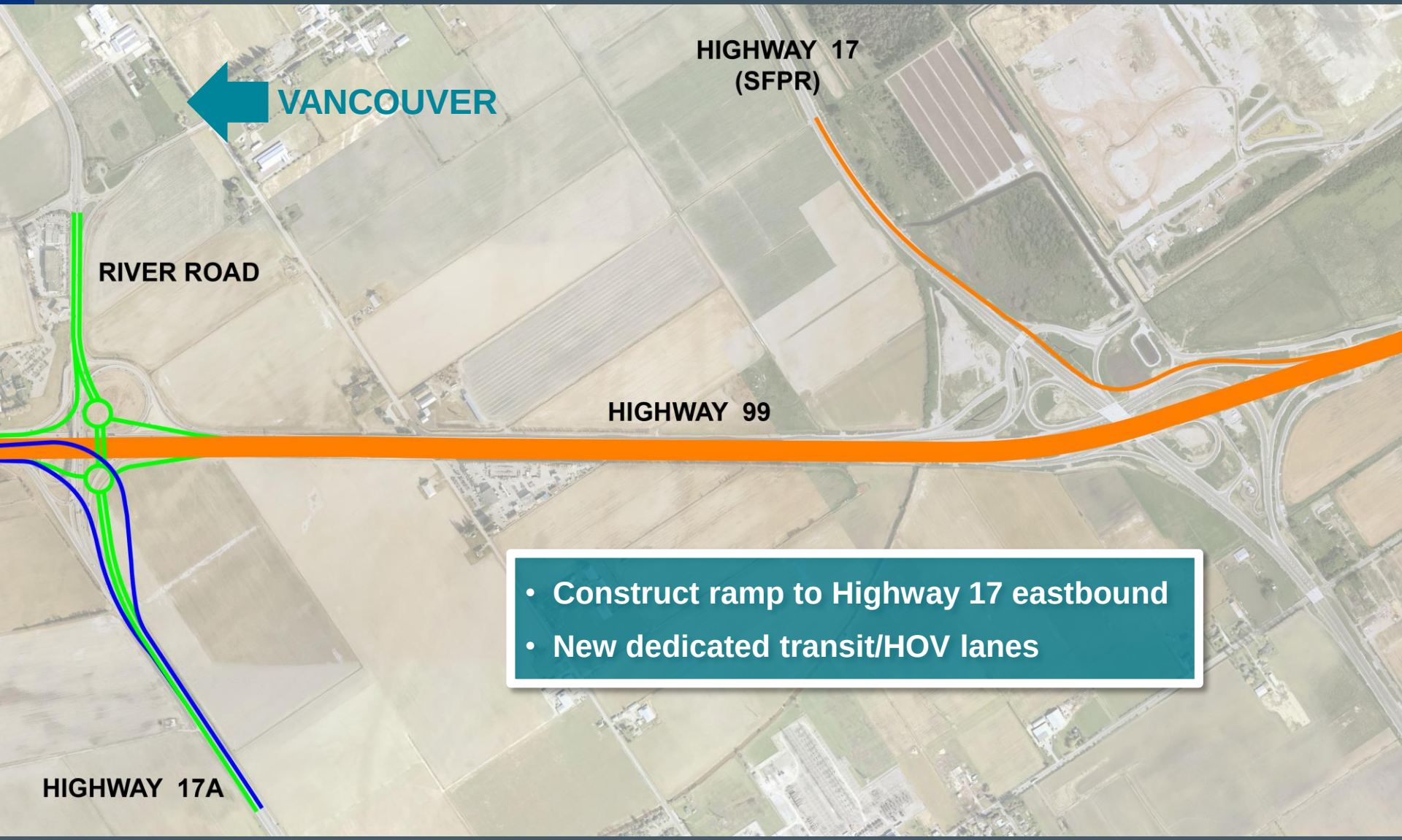
- New 10-lane (2 transit lanes) bridge on existing corridor
- Multi-use pathway for cyclists and pedestrians
- River Road access ramp to Ladner
- Restore Green Slough
- Bio-filtration/environmental enhancements under bridge

Highway 17A



- Replace Highway 17A Interchange
- Dedicated entrance to Highway 99
- Integrated transit stop
- Free flow access between Highway 17A and River Road

Highway 17A – Highway 17

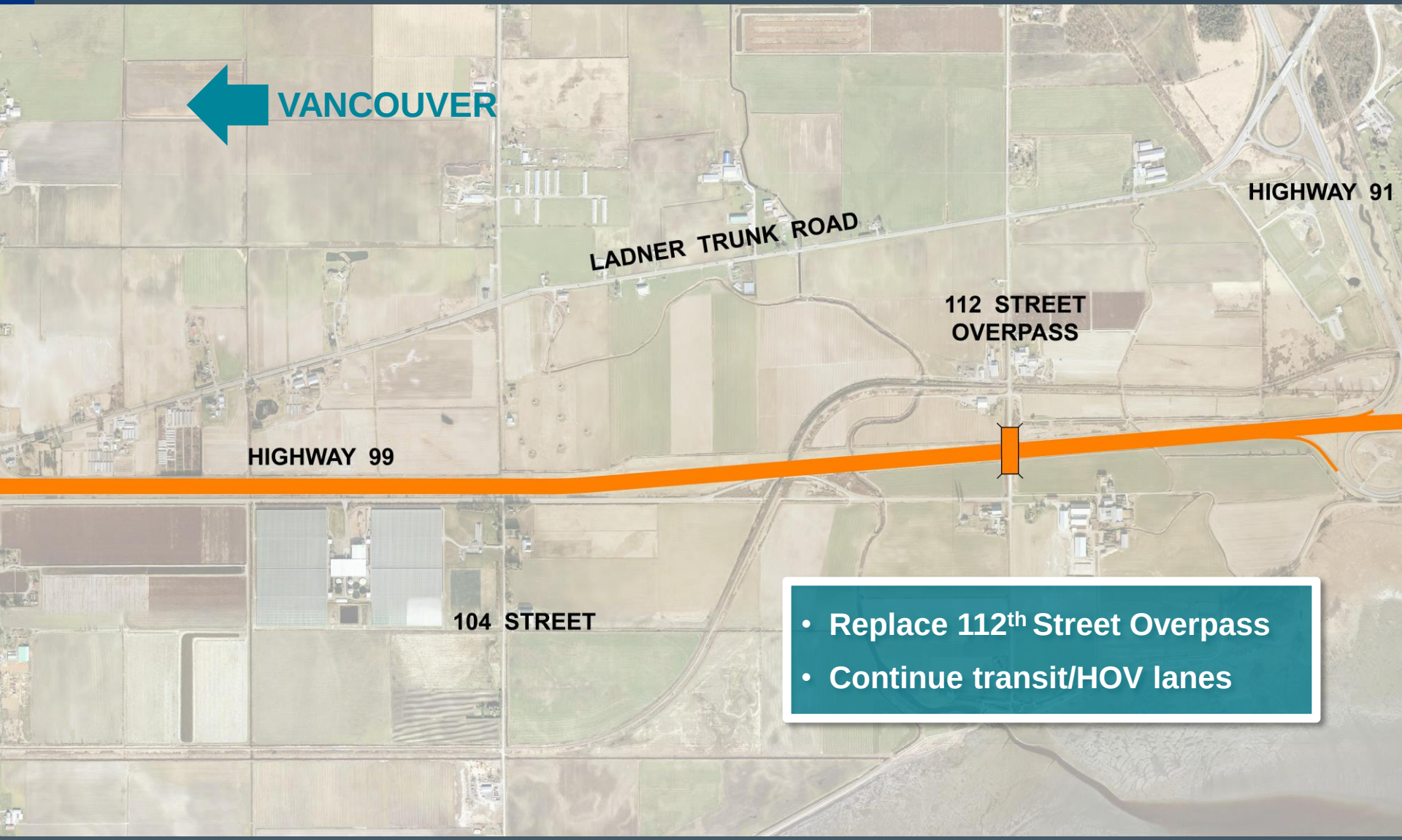


- Construct ramp to Highway 17 eastbound
- New dedicated transit/HOV lanes

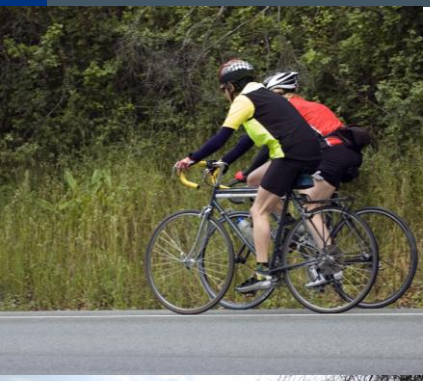
Highway 17 to Ladner Trunk Road

- Replace Ladner Trunk Road/Matthews Overpass
- Add dedicated transit/HOV lanes

Ladner Trunk Road – Highway 91



Benefit/Cost Analysis



- Quantified User Benefits:
  - Congestion reduction, travel time savings, improved reliability, vehicle operating cost savings
  - Traffic safety (35% reduction in collisions)
  - Reduced seismic risk
- Non-quantified User Benefits:
  - Cyclist/pedestrian, transit, marine traffic improvements
- Long-term economic development

Cost: $3.5 billion

Benefit/Cost Ratio: 2.1 to 1

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Travel Time Savings

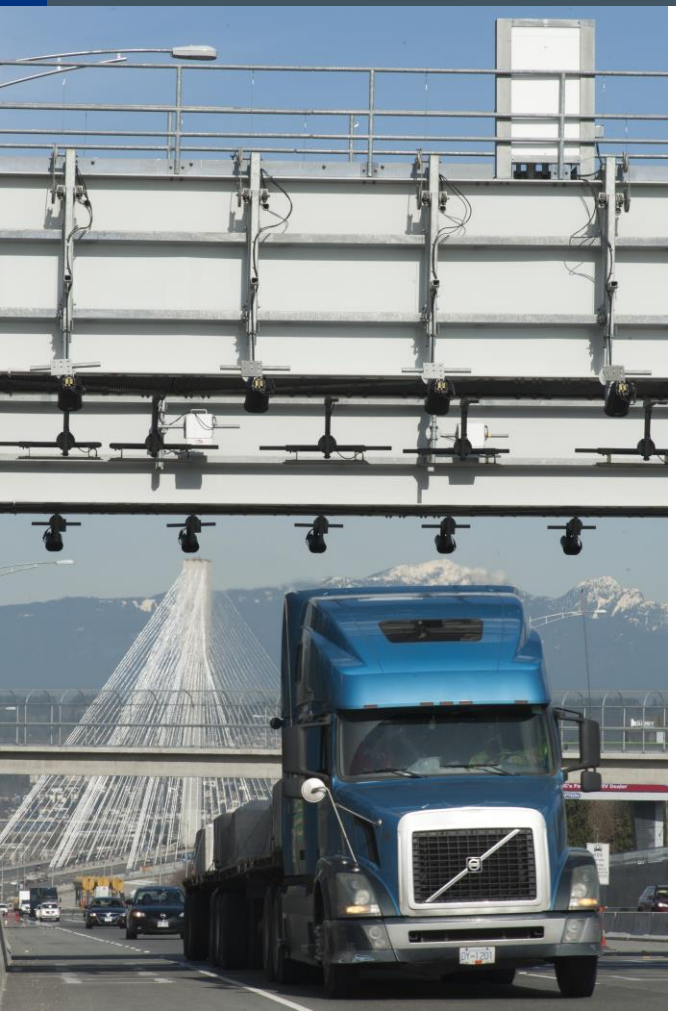
TUNNEL TODAY

- Rush Hour:
  - at capacity
  - totally congested 6-8 hrs/day
- Midday:
  - near congestion
  - incident sensitive

WITH A NEW BRIDGE

- Free-flow conditions – safer, no congestion, efficient merges/lane changes
- Average commuter will save 25 to 35 minutes per day
- Travel time savings and reliability benefits – more than $70 million in the first year; growing annually

Why Tolling?



- Significant benefits for those using the new Bridge
- Allows project to proceed now, without taking away from government funding for health and education
- Similar format to Port Mann Bridge
- Working with federal government on potential contributions

Anticipated Effects of Tolling New Crossing

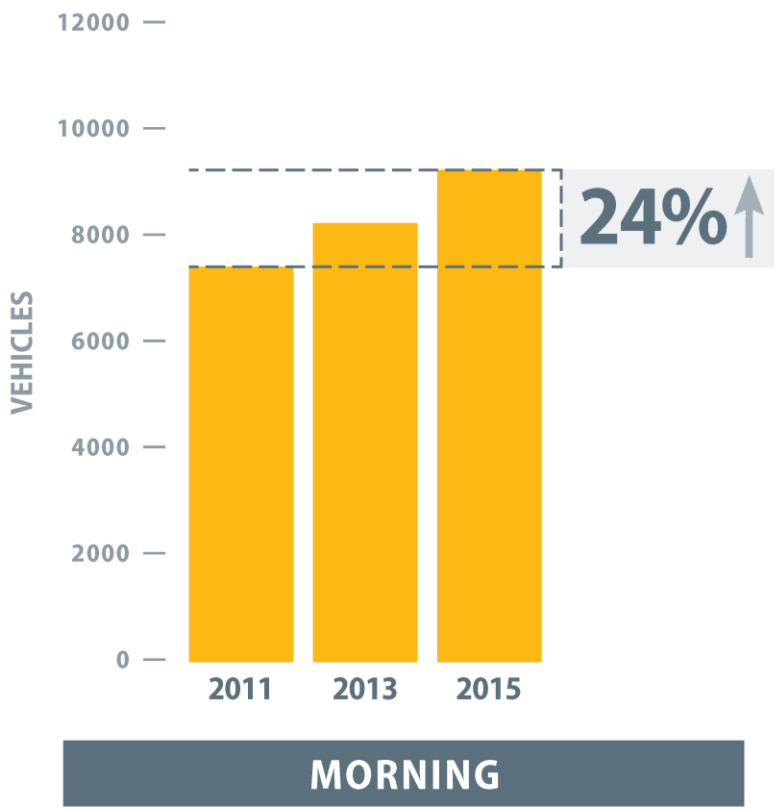
TUNNEL TODAY	WITH A NEW BRIDGE
"Rush Hour" (6-8 hours):	**Rush Hour:**
• The Tunnel and Alex Fraser Bridge (AFB) are heavily congested	• New Bridge free-flowing • Traffic in queues at AFB will move to new Bridge
Midday (6 hours):	**Midday:**
• Tunnel, AFB and Richmond Connector near congestion; incident sensitive	• Limited traffic diversion to AFB due to congestion on East/West Connector
Overnight/Weekends:	**Overnight/Weekends:**
• Free-flowing traffic	• Some traffic diversion to AFB

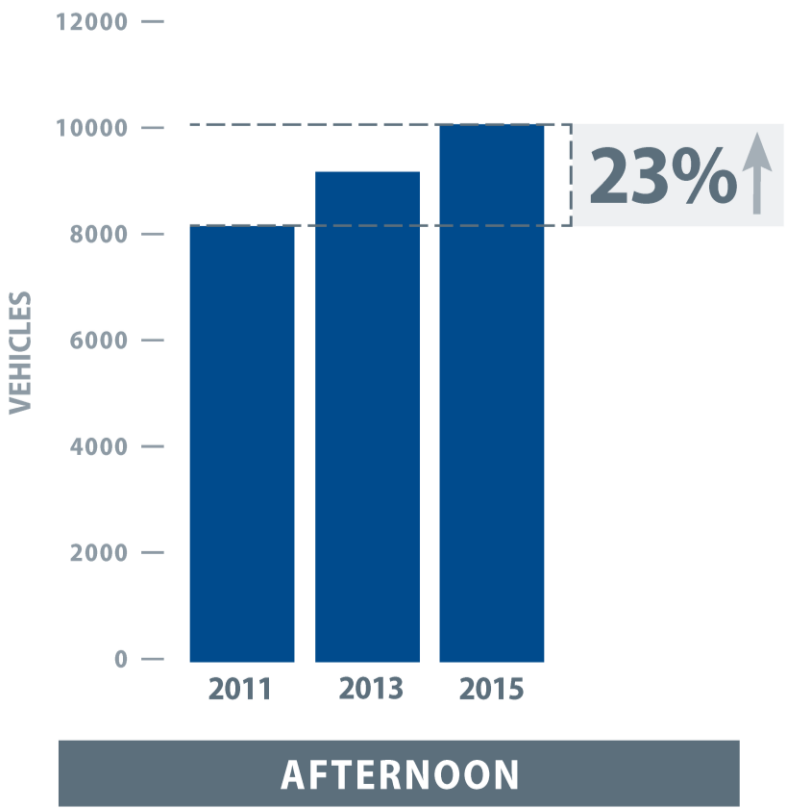
Won't People Use Alex Fraser Bridge?

Port Mann Experience:

- **Traffic by time of day:**
  - Rush-hour traffic increased significantly
  - Midday and overnight traffic decreased
- **Weekends:**
  - Traffic volumes decreased
- **Total average daily traffic:**
  - Traffic volumes decreased in 2013/2014 after tolling started in 2012
  - Traffic has increased each month in 2015

Traffic Volumes: Port Mann Bridge Rush Hour





Note: volumes represent the peak hour during rush hour periods

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Environmental Benefits

- Transit enhancements to increase ridership
- Multi-use pathway to encourage cycling/walking
- Less idling; reduced GHG emissions
- Restoring Green Slough to historic alignment
- Bio-filtration marshes for stormwater management
- Environmental enhancements in Deas Slough
- Improvements to Millennium Trail

Phase 3 Consultation: Project Definition Report

Consultation takes place December 16, 2015 to January 28, 2016. For more information:

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